

IN THE CLAIMS

Claim 1 (currently amended): A system for measuring thermal distributions of an electronic device during operation, comprising:

a heat sink adapted to be coupled with an electronic device so as to be in thermal communication with the electronic device;

an electrical-insulating layer disposed between the electronic device and the heat sink; and

a plurality of thermal sensors located adjacent to directly patterned on the electrical-insulating layer, each of the plurality of thermal sensors in a different location, wherein the plurality of thermal sensors are located within one or more thin film circuit layers disposed on the electrical-insulating layer.

Claim 2 (original): The system of claim 1, further comprising:

a module for receiving thermal information from the plurality of thermal sensors during operation of the electronic device, wherein the electronic device is operating under a range of operating conditions specified for the electronic device.

Claim 3 (original): The system of claim 2, further comprising:

a processor coupled to the module for generating a thermal distribution of the electronic device based on the thermal information received from the plurality of thermal sensors.

Claim 4 (original): The system of claim 3, wherein each of the plurality of thermal sensors is a thin film thermocouple.

Claim 5 (original): The system of claim 4, wherein the plurality of thermal sensors comprises at least twenty five thin film thermocouples.

Claim 6 (original): The system of claim 4, wherein each of the plurality of thermal sensors has a junction area of about 10,000 microns².

Claim 7 (original): The system of claim 3, wherein the heat sink is any one of a copper element and a silicon element.

Claim 8 (original): The system of claim 3, wherein each of the plurality of thermal sensors is a thin film resistor.

Claim 9 (original): The system of claim 8, wherein the plurality of thermal sensors comprises at least twenty five thin film resistors.

Claim 10 (original): The system of claim 8, wherein each of the plurality of thermal sensors has a junction area of about 10,000 microns².

Claim 11 (original): The system of claim 8, wherein the heat sink is any one of a copper element and a silicon element.

Claim 12 (original): The system of claim 3, wherein the electrical-insulating layer comprises a thin film of at least one of silicon nitride, silicon dioxide and alumina.

Claim 13 (original): The system of claim 12, wherein the thin film of the electrical-insulating layer has a thickness of less than 1 micron.

Claim 14 (original): The system of claim 3, wherein the plurality of thermal sensors comprise patterned films having a thickness from about 10 nm to about 5 microns.

Claim 15 (original): The system of claim 4, wherein thermal impedance of the plurality of thermal sensors is governed by the heat sink.

Claim 16 (currently amended): A method for measuring thermal distributions of an electronic device during operation, the method comprising:

sensing, by a plurality of thermal sensors, thermal information of an electronic device during operation of the electronic device, the plurality of thermal sensors located adjacent to directly patterned on an electrical-insulating layer, each of the plurality of thermal sensors in a different location, wherein the plurality of thermal sensors are located within one or more thin film circuit layers and wherein the electrical-insulating layer is disposed between the electronic device and the heat sink.

Claim 17 (original): The method of claim 16, further comprising:

receiving, by a module, thermal information from the plurality of thermal sensors during operation of the electronic device, wherein the electronic device is operating under a range of operating conditions specified for the electronic device.

Claim 18 (original): The method of claim 17, further comprising:

generating a thermal distribution of the electronic device based on the thermal information received from the plurality of thermal sensors.

Claim 19 (original): The method of claim 18, wherein each of the plurality of thermal sensors is any one of a thin film thermocouple and a thin film resistor.

Claim 20 (original): The method of claim 18, wherein the plurality of thermal sensors comprise patterned films having a thickness from about 10 nm to 5 microns.

Claim 21 (currently amended): A system for measuring thermal distributions of an electronic device during operation, comprising:

an electronic device a heat sink in thermal communication with the electronic device;

an electrical-insulating layer disposed between the electronic device and the heat sink; and

a plurality of thermal sensors located adjacent to directly patterned on the electrical-insulating layer, each of the plurality of thermal sensors in a different location, wherein the plurality of thermal sensors are located within one or more thin film circuit layers disposed directly on the electrical-insulating adjacent to insulating insulating layer.